



Séminaire ISIR

Dr. Emel Demircan

Le Vendredi 3 mai 2013 à 11h00

Campus Jussieu, 4 place Jussieu, Paris
Salle de réunion H20

Titre: Robotics-based Reconstruction and Synthesis of Human Motion

Abstract:

Understanding human motion requires accurate modeling of the kinematics, dynamics, and control of the human musculoskeletal system to provide the bases for the analysis, characterization, and reconstruction of our movements. In motion analysis, we present methodologies to characterize human postural behaviors and dynamic skills in a unified framework including the task, posture, contact with the environment and physiological capacity. We develop human performance metrics and use the information given by the musculoskeletal models mapped into the motion of the human in a task-oriented simulation framework. In motion control and synthesis, we present algorithms for redundancy resolution and real-time control of the musculoskeletal system. For muscle redundancy resolution, we use hybrid electromyography and conventionally computed muscle control methods and apply them for dynamic simulations of human movement. Robotics-based reconstruction and synthesis provide a basis for understanding natural human motion and the tools applicable for efficient robot control, human performance prediction, or synthesis of novel motion patterns in the areas of robotics research, athletics, rehabilitation, physical therapy and computer animation.

Bio:

Dr. Emel Demircan is a post-doctoral scholar working with Professor Oussama Khatib in the Robotics Research Laboratory in the Computer Science department at Stanford University. Her research focuses on the application of dynamics and control theory for the simulation and analysis of biomechanical and robotic systems. Her research interests include human motion dynamics, control and simulation; sports biomechanics; robotics for rehabilitation; and motion analysis for physiotherapy exercises. Emel received both her Ph.D.'12 and her M.S.'07 in Mechanical Engineering from Stanford University and her B.S.'06 in Mechanical Engineering and in Industrial Engineering from Robert College.

Sous la co-tutelle de